Case Study—Energy

ETV Addresses National Priorities: Low Emission Energy Technology

Several ETV pilots are evaluating energy-related technologies, as well as other technologies that address major national issues. Verifications have been completed for several exciting and innovative technologies that both improve the environment and have positive impact on the energy marketplace. These verifications provide information relevant to the current energy challenges and will be of particular interest to government and private sector decision-makers contending with energy availability and environmental quality issues. These technologies can and should be a part of the nation's approach to energy production in the 21st century.

The ETV Greenhouse Gas Technology Pilot verified a number of distributed generation technologies that hold enormous potential for clean and cost-effective energy production. *Microturbines* are small-scale, gas-fired electricity generation devices that are immediately deployable and affordable. ETV verified the performance of a **Honeywell** (Albuquerque, NM) microturbine and microturbine carbon monoxide (CO) emission control device. These technologies produce lower greenhouse gas, NO_x, and criteria pollutant (including CO) emissions compared to electricity generation at existing power stations. *Microturbines With Combined Heat and Electrical Power (CHP)* are microturbines that also produce hot water and space heating using waste heat. ETV verified the performance of a **Mariah Energy** (Calgary, Canada) microturbine-CHP, which included a **Capstone** (Woodland Hills, CA) microturbine as one key component, and is evaluating a commercial microturbine-CHP system for use in the natural gas industry (Honeywell-based). These units are capable of very high energy efficiency and reduce emissions of greenhouse gases and criteria pollutants. *Natural Gas Leak Control Technologies* can provide significant economic, energy, and environmental benefits by recovering and using "fugitive" methane from large engine/compressor systems. ETV verified the performance of these technologies from **A&A Environmental Seals** (La Marque, TX), **C. Lee Cook** (Louisville, KY), and **France Compressor Products** (Newton, PA).

The ETV Air Pollution Control Technology Pilot verified the performance of the Xonon™ Cool Combustion System (**Catalytica Energy Systems**, Mountain View, California)—a unique system that eliminates NO_x produced within the combustion chamber of a gas turbine—confirming that this system reduces NO_x emissions well below EPA's standards, while maintaining electrical generating capacity.

The ETV Advanced Monitoring Systems Pilot verified the performance of portable NO/NO_2 emission analyzers from **Bacharach** (Pittsburgh, PA), **COSA Instruments** (Norwood, NJ), **ECOM America** (Norcross, GA), **Energy Efficiency Systems** (Westbury, NY), **Land Combustion** (Newton, PA), **Testo** (Flanders, NJ), and **TSI** (Shoreview, MN). These analyzers efficiently measure NO_x emissions from a variety of combustion sources, providing information to help minimize emissions without compromising energy efficiency. The Advanced Monitoring Systems Pilot is also evaluating mercury continuous emission monitors that measure mercury emissions in real time from coal-fired power plant stacks, allowing plant operators and technology vendors to design and install systems that control certain mercury species and/or to design new or upgrade existing equipment for optimal mercury capture.

Numerous other exciting energy-related technologies such as fuel cells, industrial engine/generator sets, residential heating and power systems, diesel engine retrofit technologies, and monitors that measure emissions and increase operating efficiencies are being addressed by ETV.